"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F.T.

Certain problems in general epidemiology; problem of the nature and significance of social conditions in epidemiology. Zhur.mikrobiol. epid. i immun. no.9:95-98 S '54. (MLRA 7:12)
(EPIDEMIOLOGY,
in Russia, soc. & econ. factors)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F.T., polkovnik meditsinskoy sluzhby

Use of nonionogenic accessory surface-active substances in disinfection. Voen-med. zhur. no.1:54-56 Ja '56 (MLRA 10:5)

(SURFACE-ACTIVE SUBSTANCES,
non-ionogenic accessory substances in disinfection) (Rus)
(ANTISEPSIS AND ASEPSIS,
non-ionogenic accessory surface-active substances in disinfection) (Rus)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F.T.

KOROVIN, F.T.; P'YANKOV, B.F.

Use of ethylene oxide in disinfection and sterilization; survey of foreign research. Zhur.mikrobiol.epid. i immun. 28 no.8:60-63 Ag '57. (MIRA 11:2)

(ETHYLENE OXIDE,
disinfect. & sterilization, review (Rus))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F.T.

Testing insecticidal properties of organic phosphate preparations on Aedes mosquitoes. Med.paraz. i paraz.bol. 27 no.3:341-344 My-Je '58
(MIRA 11:7)

(MOSQUITOES,
Aedes, eff. of phosphates (Rus))
(PHOSPHATES, effects,
on Aedes (Rus))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F. T., GUTSEVICH, A. V., PERFIL'YEV, P. P., POGODINA, E. A., FEDOROV, M. N., SPRERANSKAYA, V. N., SIYANITSKIY, F. M., SHUSTROV, A. K., ALEKSANDROV, P. M., KLEVAKIN, V. N., BORISKIN, M. M., LIL'P, G. M., ZIL'BERMINTS, I. V., GUDNEVA, O. A., POPOV, S. C. and DENISENKO, V. K.

"The Effectiveness of a Chemical Method for Combatting Arthropods Over Large Areas from Airplanes."

Tenth Conference on Parasitological Problems and Diseases with Natural Reservoirs, 22-29 October 1959, Vol. II, Publishing House of Academy of Sciences, USSR, Moscow-Leningrad, 1959.

(Leningrad - Moscow)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

4(5)

SOV/16-59-6-8/46

AUTHORS: Korovin, F.T., Nuzhdin, I.D. and Filippenko, A.I.

TITLE: Disinfection as a Means of Antibacteriological Defense

PERIODICAL: Zhurnal mikrobiologii, epidemiologii i immunobiologii, 1959, 30, Nr 6, pp 40-44 (USSR)

ABSTRACT: The authors deal with the principles and methods of decontamination and disinfection in bacteriological warfare. The information is based on foreign manuals and pamphlets on the subject, mostly US. There are 3 American references.

SUBMITTED: December 16, 1958

Card 1/1

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, F.T.; BELOKHVOSTOV, S.D.; SUVOROV, V.S.; YURCHENKO, M.M.; SYTNIK, V.A.

Room disinfection by means of chemical sublimation of formaldehyde and chlorine. Voen.-med. zhur. no.6:49-51 Je '61. (MIRA 14:8)
(DISINFECTION AND DISINFECTANT) (FORMALDEHYDE)
(CHLORINE)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KUZNETSOV, Boris Grigor'yevich; KOROVIN, G.M., redaktor; MURASHOVA, N.Ya., tekhnicheskiy redaktor [redacted]

[Lomonosov's creative career] Tvorcheskiy put' Lomonosova. Moskva, Gos. izd-vo tekhniko-teoret. lit-ry, 1956. 380 p. (MIRA 10:3)
(Lomonosov, Mikhail Vasil'evich, 1711-1765)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KRYUKOV, I.M., monter; KOROVIN, G.S., elektromekhanik; FEDOROV, I.M., elektromekhanik

Device for lifting storage battery plates. Avr., telem. i sviaz' 5 no.1:25-26 Ja '61. (MIRA 14:3)

1. Pushkinskaya distantsiya signalizatsii i svyazi Moskovskoy dorogi (for Kryukov).

(Storage batteries)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

TERSKIKH, V.I.; KOROVIN, I.L.; BORODINA, L.T.

Interspira suilla nom.nov., a new micro-organism from the same class as Spirochaetaceae. Veterinariia 32 no.12:66-67 D '55.
(PROTOZOA, PATHOGENIC) (PARASITES--SWINE) (MLRA 9:4)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, I.M. (Moskva)

Experimental determination of the stress-strain relation under combined loading along the trajectory with one angle point. Inzh.zhur. 4 no.3:592-600 '64. (MIRA 17:10)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

PSHENNIKOV, N.V., spetsred.; KOROVIN, K.I., vedushchiy red.

[Modernization of equipment of the macaroni industry; operating experience of the Moscow No.1 and Leningrad factories, of the Tallinn Grain House and the Central Scientific Research Laboratory of the Macaroni Industry] Modernizatsiia oborudovaniia makaronnoi promyshlennosti; iz opyta raboty Moskovskoi No.1 i Leningradskoi makaronnykh fabrik, Tallinskogo zernokombinata i TsNILMAP. Moskva, 1959. 35 p. (MIRA 13:6)

1. Moscow. Vsesoyuznyy institut nauchnoy i tekhnicheskoy informatsii.

(Macaroni)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

DEMCHINSKIY, Fedor Antonovich, spetsred.; KOROVIN, K.I., red.

[Experience in the designing and construction of sugar factories in the Krasnodar Territory] Opyt proektirovaniia i stroitel'stva sakharnykh zavodov v Krasnodarskom krae. Moskva, 1960. 66 p. (MIRA 13:6)

1. Moscow. Vsesoyuznyy institut nauchnoy i tekhnicheskoy informatsii.
(Krasnodar Territory--Sugar industry)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

SHMIDT, A.A., spets. red.; KOROVIN, K.I., red.; BOCHAROVA, I.V., tekhn. red.

[Exchange of experiences in continuous soap production] Obmen opytom po nepreryvnomu proizvodstvu myla. Moskva, 1962. 110 p. (MIRA 15:11)

1. Moscow. Gosudarstvennyy nauchno-issledovatel'skiy institut nauchnoy i tekhnicheskoy informatsii.
(Soap industry) (Assembly-line methods)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

GORBATOV, V.M., red.; KOROVIN, K.I., red.

[Overall mechanization and automation of technological processes in packing houses] Kompleksnaia mekhanizatsiia i avtomatizatsiia tekhnologicheskikh protsessov na miasokombinatakh. Moskva, GOSINTI, 1962. 107 p.
(MIRA 17:4)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

2026 KOROVIN, K. S.

Raspredeleniye po trudu ekonomicheskiy zakon sotsiazizma. L., 1954, 24 s. 20 sm. (M-vo vyssh. obrazovaniya SSSR. Leningr. fin-ekon. in-t) 100 ekz. B.ts. (54-56933)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, K.S.

Forerunners of scientific socialism on the just distribution of products in society. Trudy LIEI no.35:144-158 '61. (MIRA 14:8)
(Utopias)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, L.I.

USSR/Physical Chemistry - Crystals, B-5

Abst Journal: Referat Zhur - Khimiya, No 19, 1956, 60941

Author: Ansel'm, A. I., Korovin, L. I.

Institution: None

Title: Conditions of the Electron of Admixture Center in an Anisotropic Crystal

Original Periodical: Zh. tekhn. fiziki, 1955, 25, No 12, 2044-2049

Abstract: Considered are the stationary conditions of the electron in the field of admixture center of atomic crystal taking into account the anisotropy of the effective mass of electron as well as of the permittivity of the crystal. The wave equation thus obtained is solved by direct variational method. Energy levels and wave functions are calculated for the basic and excitation conditions.

Card 1/1

Korovin, L.I.

AUTHOR: ANSEL'M, A.I., KOROVIN, L.I. PA - 2345

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-

TITLE: The State of an Electron in a Center of Admixtures in an Anisotropic Crystal. (Sostoyanie elektrona primesnogo tsentra v anisotropnom kristalle, Russian).

PERIODICAL: Izvestiia Akad.Nauk SSSR, Ser.Fiz. 1957, Vol 21, Nr 1, pp 69-69 (U.S.S.R.)

Received: 4 / 1957 Reviewed: 4 / 1957

ABSTRACT: In the following the literal translation of the short table of contents of this lecture is given. The detailed article was published in Zhurnal Tekhn.Fiz, 1955, Vol 25, 2044.
The steady states of an electron in an admixture center of an atomic semiconductor are investigated in consideration of the tensor character of the effective mass of the electron and the dielectricity of the crystal.
By means of the direct variation method the energy levels and the wave functions of the ground state and the excited states are computed. (No illustrations)

ASSOCIATION: Not given

PRESENTED BY:

SUBMITTED:

AVAILABLE: Library of Congress

Card 1/1

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, L.I.

PA - 3539

AUTHOR KOROVIN L.I.

TITLE Interaction of Impurity Center Electron with Acoustic Vibrations in One Axis Crystals.

Vzaimodeystviye elektrona primesnogo tsentra s akusticheskimi kolebaniyami odnoosnogo kristalla -Russian)

PERIODICAL Zhurnal Tekhn. Fiz., 1957, Vol 27, Nr 5, pp 905 - 913 (U.S.S.R.)

ABSTRACT In a number of papers the states and the spectra of an admixture (impurity center) electron in ion- and atomic crystals of cubic symmetry were investigated, on which occasion the effective mass of the electron, the dielectric constant of the crystal, and the interaction component (electron-lattice oscillations) are characterized by scalar quantities. In other papers the state of the admixture electron was investigated in consideration of the anisotropy of the crystal, on which occasion the scalar effective mass and the dielectric constant was replaced by tensor quantities. In this papers both methods of investigation are joined, and the state of an anisotropic admixture center, which is in arbitrary interaction with the lattice, is investigated. Atom crystals are considered for which the energy of the interaction of the electron with the acoustic oscillations can be written down in form of a deformation potential $H_{WW} = \sum_{i,k=1}^{3} a_{ik} u_{ik}$ where U_{ik} denotes the tensor of deformation and a_{ik} the tensor of the constant of interaction. The usual method of adiabatic approximation is employed and the displacement of the equilibrium positions of the nuclei at electron transitions is

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... Center Electron with Acoustic Vibrations in One Axis Crystals.

taken into account; and accordingly the Schroedinger equation for the electron part of the wave function of the system can be written down in form of a variation principle. In this functional, summation, according to the vector k (wave vector) is replaced by integration according to the half of the first zone of Brillouin. The interaction of the admixture electron with two oscillation branches, which are approximatively assumed as transversal oscillations, is taken into account. The error for hexagonal crystals is investigated. By the variation method and the methodof the steady theory of fluctuations the energy levels and the wave functions of the original and of the first state of excitation as well as the half width of the corresponding absorption band are computed. (With 2 illustrations, 1 table, and 7 Slavic references).

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SUBMITTED 6.10.1956

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, L. I.

57-27-7-22/40

AUTHORS: Ansel'm, A. I., Korovin, L. I.,

TITLE: Calculation of the Oscillator Strengths for the Transitions of an Additional Electron in Uniaxial Crystals (Vychisleniye sil ostsillyatorov dlya perekhodov primesnogo elektrona v odnoosnom kristalle)

PERIODICAL: Zhurnal Tekhnicheskoy Fiziki, 1957, Vol. 27, Nr 7, pp. 1584-1586 (USSR)

ABSTRACT: Reference is made to the authors' paper in Zhurnal Tekhnicheskoy Fizki, 1955, Vol. 25, p. 2044. Only dipole-transitions and uniaxial crystals are investigated here. I. e. when the effective electron - -masses are $m_2 = m_3$ and the dielectric constants of the crystal are $_2 = _3$. On this condition the non-excited part of the Hamiltonian function is axially symmetric and the wave functions of the zeroth approximation differ according to their distinctness. It is shown that the light with the vector E which is parallel with the axis of symmetry of the crystal causes transitions to the odd non-degenerate terms with $m_x = 0$ (m_x is the quantum number) and that the light with a correspondingly different polarization causes transitions to the double-degenerate odd levels with $m_x = \pm 1$. It is shown that the strengths of the oscillators and therefore also the probability of a transition chiefly depend on the anisotropy-parameter. When B 1 a transition to the next excited level is most probable, the probability of the

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

Calculation of the Oscillator Strengths for the Transitions of an Additional Electron in Uniaxial Crystals. 57-27-7-22/40

transition increasing with increasing anisotropy. $\beta = {}_1m_1 / {}_2m_2$ is the anisotropy-parameter. When $\beta > 1$ the process is analogous, but in this case the next level will be the double-degenerate one. There are 1 table and 5 **references, 4 of which are Soviet.**

ASSOCIATION: Institute for Semiconductors AS USSR, Leningrad (Institut poluprovodnikov AN SSSR, Leningrad).

SUBMITTED: December 14, 1956

AVAILABLE: Library of Congress.

1. Crystals-Electron transitions-Mathematical analysis 2. Electron transitions-Oscillator strength-Mathematical analysis

Card 2/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, L.I., Cand Phys-Math Sci -- (diss) "The effect of anisotropy of crystals upon the optical [redacted] properties of impure ~~nuclei~~ centers." Len, 1958. 16 pp. (Len Phys-~~Engineering~~ Tech Inst Acad Sci USSR). 100 copies.
(KL, 12-58, 95)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, L.I.; FIRSOV, Yu.A.

Structure of the hole zone tellurium. Zhur. tekh. fiz. 28 no.11:2417-2427 N '58. (MIRA 12:1)
(Tellurium)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

24.2400 24.7800

67324

~~9(3), 24(6)~~

SOV/181-1-8-29/32

AUTHOR: Korovin, L. I.

TITLE: Calculation of the Refractive Index Near the Edge of the Natural Absorption for Atomic Semiconductors

PERIODICAL: Fizika tverdogo tela, 1959, Vol 1, Nr 8, pp 1311-1316 (USSR)

ABSTRACT: The author investigated the dispersion of the dielectric constant which is dependent on direct transitions of electrons from the valence band into the conduction band. With the frequencies applied here, electrons of inner atomic layers offer but a very weak frequency-dependent additional member to polarizability, which can be taken into account by means of a constant. From the quantum-mechanical point of view dispersion is a process of the second order of the perturbation theory, the electron state remaining unchanged. The dispersion related with such processes little depends on temperature because the temperature dependence is determined by the change in width of the forbidden zone. Moreover, also a dispersion related with the indirect transitions of electrons (with the participation of phonons) is still possible. In this case dispersion would be determined by processes of the

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

67324

Calculation of the Refractive Index Near the Edge of the Natural Absorption for Atomic Semiconductors SOV/181-1-8-29/32

fourth order. The refractive index is calculated according to classical conceptions which are used in the dispersion of gases and vapors. The equation of motion of an elastically bound electron in the field of a light wave has the form

$$\frac{d^2\eta}{dt^2} + \omega'\frac{d\eta}{dt} + \omega_o^2\eta = \frac{eE}{m}$$

. Here, η denotes the coordinate of the oscillator deviation from the position of equilibrium, m is the mass of a free electron, e is its charge, and ω' describes the oscillator attenuation. Attenuation must be taken into account in the investigation of dispersion in frequency ranges in which there is also an absorption. For the complex refractive index one finds

$$\mu^2 = 1 + \frac{8\pi e^2}{3m^2\hbar}\sum_{\vec{k}}\frac{|p(\vec{k})|^2}{(\omega_o^2 - \omega^2 + i\omega'\omega)\omega_o}$$

, where $p(\vec{k})$ denotes the matrix element of the pulse for the transitions

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

67324

SOV/181-1-8-29/32

Calculation of the Refractive Index Near the Edge of the Natural Absorption for Atomic Semiconductors

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: April 28, 1959

4

Card 4/4

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

86434

S/181/60/002/011/020/042
B006/B056

6.3000 (1024,1035,1140)

AUTHORS: Korovin, L. I. and Bulashevich, T. Yu.

TITLE: Oscillations of the Absorption Coefficient of Tellurium in a Magnetic Field Running Along the Optical Crystal Axis

PERIODICAL: Fizika tverdogo tela, 1960, Vol. 2, No. 11, pp. 2795-2804

TEXT: An analysis of the absorption spectrum of tellurium single crystals in polarized light within the region of absorption by free carriers makes a construction of the hole band of tellurium possible. As already shown, the hole band is not degenerate and has either one extremum in the center of the Brillouin zone or two centers symmetrically arranged on the optical axis (C_3). Measurements of the absorption coefficient carried out by V. M. Korsunskiy and M. P. Lisitsa indicate that the second probability is more probable. The authors of the present paper study oscillations of the absorption coefficient in a magnetic field, which are due to direct transitions of electrons from the filled valence band to the hole band. Contrary to Refs. 5, 6, the dispersion law in the lower band is assumed to be not only quadratic but also linear with respect to the irreducible

Card 1/3

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

86434

Oscillations of the Absorption Coefficient of Tellurium in a Magnetic Field Running Along the Optical Crystal Axis

S/181/60/002/011/020/042
B006/B056

quantum number of the terms. Besides, the mutual position of the bands differs from their position in transitions into the conduction band. This entails an extraordinary dependence of the oscillations on light frequency. The absorption spectrum of infrared radiation in tellurium single crystals is calculated for a magnetic field that is parallel to the symmetry axis of the crystal. The calculations are carried out in single-electron approximation by the method of the effective mass. The present paper consists of two parts. Chapter 1 derives expressions for oscillations without taking account of collisions between electrons and phonons or impurity ions. This simplification causes the absorption coefficient to tend to infinity at certain frequencies. In Chapter 2, these collisions are taken into account by the phenomenological introduction of a half-width of the electron levels in the hole band. Thus, not only the position of the oscillation peaks on the frequency curve may be determined, but also the shape of the absorption peaks may be described. The results are finally discussed. Professor A. I. Ansel'm is thanked for discussions. There are 1 figure and 7 references: 4 Soviet and 3 US.

Card 2/3

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

86434

Oscillations of the Absorption Coefficient of Tellurium in a Magnetic Field Running Along the Optical Crystal Axis

S/181/60/002/011/020/042
B006/B056

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: June 28, 1960

Card 3/3

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

24921 S/181/61/003/006/018/031
B102/B201

24.3600

AUTHOR: Korovin, L. I.

TITLE: Oscillations of the refractive index in a strong magnetic field in semiconductors in the region of the self-absorption edge

PERIODICAL: Fizika tverdogo tela, v. 3, no. 6, 1961, 1790 - 1794

TEXT: The present paper offers an estimation of the order of magnitude of oscillations of the refractive index of light in a strong magnetic field, caused by direct transitions of electrons between the Landau bands in the valence band and the conduction band. The energy of the light quantum must be obviously high enough to permit a direct transition of an electron from the valence band into the conduction band. Calculations are based upon the simplest model: operations are made in single-electron approximation; a quadratic law is assumed for the dispersion of electrons (of the valence band), valence band and conduction band are considered to be nondegenerate, and their extreme values are assumed to be in the center of the Brillouin zone. In the frequency range concerned (self-absorption edge), the effects

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

24321 S/181/61/003/006/018/031
B102/B201

Oscillations of the refractive...

X

of the various mechanisms of infrared absorption (absorption of the lattice, of free carriers, of impurity centers, and indirect transition) may be neglected. The electrons of the inner atomic layers at these frequencies practically yield no frequency-dependent contribution to polarizability. The calculation of the refractive index fits the quantum-mechanical dispersion theory; every electron is approximated by a classical oscillator, whose natural frequency ν is equal to the electron energy difference in the valence and conduction bands with conservation of momentum. Also the gyrotropy of the medium arising in the magnetic field is neglected. Thus, the motion of an electron in the polarized light wave field can be described by $\frac{d^2Z}{dt^2} + \eta\frac{dZ}{dt} + \nu^2 Z = e\mathcal{E}/m$, where Z denotes the coordinate of the deviation of the oscillator from equilibrium position under the action of the electric vector of the light wave, m and e denote mass and charge of the electron, η characterizes the oscillator damping, $\mathcal{E}$ is the amplitude of the electric vector of the light wave. For the electron energy in the valence band and conduction band, respectively, one obtains

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24921

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Oscillations of the refractive...

$$E_v = -E_g - \frac{\hbar^2 k_z^2}{2m_v} - \hbar\Omega_v\left(n + \frac{1}{2}\right); \quad E_e = \frac{\hbar^2 k_z^2}{2m_e} + \hbar\Omega_e\left(n + \frac{1}{2}\right) \qquad (4)$$

where m_i and Ω_i are the effective masses and the Larmor frequencies corresponding to them, E_g is the forbidden-band width for the direct transition.

$$\hbar\nu = E_e - E_v = E_g + \frac{\hbar^2 k_z^2}{2M} + \hbar\Omega\left(n + \frac{1}{2}\right), \qquad (5)$$

$$\Omega = \frac{|e|H}{Mc}; \quad M = \frac{m_e m_v}{m_e + m_v}. \qquad (6)$$

are valid. One therewith obtains for $\mathrm{Re}\,\varkappa^2 = n^2 - n^2\chi^2$ ($\varkappa = n - in\chi$, the complex refractive index): $n^2 - n^2\chi^2 = 1 + D\sum_{n}\mu_n$, where

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$$\mu_n = \frac{E_g^{1/2}}{2^{1/2}(\hbar\omega)^2}\left\{\frac{\left[\sqrt{(\hbar\omega - E_g^n)^2 + \delta^2} + (E_g^n - \hbar\omega)\right]^{1/2}}{\left[(\hbar\omega - E_g^n)^2 + \delta^2\right]^{1/2}} + \frac{2^{1/2}}{(E_g^n + \hbar\omega)^{1/2}} - \frac{2^{1/2}}{(E_g^n)^{1/2}}\right\}, \qquad (8)$$

$$E_g^n = E_g + \hbar\Omega\left(n + \frac{1}{2}\right); \quad \delta = \frac{\hbar\eta}{2}, \qquad (9)$$

$$D = \frac{\hbar\Omega}{E_g}\frac{|C|^2}{mE_g}\left(\frac{M}{m}\right)^{3/2}\frac{2^{3/2}}{3}\frac{e^2 m^{1/2}}{\hbar E_g^{1/2}}. \qquad (10)$$

Here, $\sum_n$ denotes summation over the various Landau bands. Each μ_n describes the contribution to polarizability coming from an electron transition between two Landau bands with equal n. The function $\sum_m \mu_n$ has been tabulated, and the first two oscillations are graphically represented in the figure (for E_g = 1 ev); the continuous curve shows $\varphi_2 = (N^2-A)/D$, the dashed curve $\mu_0 \cdot \varphi_m(\hbar\omega) = \sum_{m=0}^{m} \mu_n$. As may be seen from the diagram, $\Delta\varphi_3 = \varphi_3^{max} - \varphi_3^{min} \simeq 60$. The complete refractive index is given by $N = \sqrt{A + D\varphi_m(\hbar\omega)}$, where constant A contains both the polarizability of the inner atomic layers and the part

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of polarizability connected with the valence electrons. An estimation of D yields $D \simeq 10^{-3}$, i.e., condition $A \gg D\varphi_m(\hbar\omega)$ is mostly fulfilled. Then, it will be also $\Delta N = D\Delta\varphi_m/2A^{1/2} \simeq 10^{-2}$. (If $\hbar\Omega = 10^{-2}$ ev is assumed, $\Delta N \simeq 10^{-1}$). For germanium (reduced mass $M \simeq 0.04$ m) $\hbar\Omega = 10^{-2}$ev, $H = 4 \cdot 10^4$oe, $\delta = 10^{-4}$ev and $\tau = 10^{-11}$sec. The interval between adjoining oscillations, $\hbar\Omega$, grows linearly with H. Professor A. I. Ansel'm is finally thanked for his discussions. There are 1 figure and 3 non-Soviet-bloc references. The references to English-language publications read as follows: E. Burstein, G. Picus, R. Wallis, F. Blatt. Phys. Rev., 113, 15, 1959. S. Zwerdling, B. Lax, L. Roth, K. Button. Phys. Rev., 114, 80, 1959. S. Korff, G. Breit. Rev. Mod. Phys., 4, 471, 1932.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: December, 3, 1960(initially), January 11, 1961(after revision)

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24.3600

AUTHOR: Korovin, L. I.

TITLE: Magnetooptical absorption spectra in semiconductors with any form of isoenergetic surfaces of electrons. Case of closed trajectories

PERIODICAL: Fizika tverdogo tela, v. 3, no. 8, 1961, 2202-2213

TEXT: Oscillations of the absorption coefficient occurring in a strong magnetic field are usually related to direct transitions of electrons between two Landau levels of equal quantum numbers (situated in different bands). This type of magnetooptical absorption spectrum had been hitherto studied both experimentally and theoretically; the region of the self-absorption edge in Ge or InSb is the best suited for this purpose. In all such investigations, the electron energy was taken to be a quadratic function of $\vec{k}$. A case is now considered, where the state of the electron with certain $\vec{H}$ directions cannot be described by a quadratic dispersion law. The semiconductor is supposed to have the following band

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Magnetooptical absorption...

structure: in the conduction band, the extremum is located in a point $\vec{k}_0 \neq 0$; the extremum in the valence band does not coincide with the extremum in the conduction band, and the least distance ΔE of a direct transition is in the point $\vec{k}_0$. For describing the self-absorption edge, electron isoenergetic surfaces in the conduction band may be approximated by ellipsoids. The magnetooptical absorption spectrum at the self-absorption edge is here examined under these premises. The wave functions describing the electron states are first determined, and the selection rules for the matrix element of the momentum are discussed. The magnetooptical absorption spectrum is now calculated for the case where the isoenergetic surfaces of the valence electrons near $\vec{k}_0$ can be described by ellipsoids (quadratic dispersion law). Only then the attempt is made to calculate the absorption spectrum for the case of any dispersion law.

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Magnetooptical absorption...

Ansatz

$$W = \frac{Ai e F}{m\omega}\left\{\sum_{k_s}\Gamma(k_s)\int_{-\infty}^{+\infty}\sum_j \chi_j^*(k_s)\left(\left|\frac{\partial e}{\partial \varphi_j'}\right|\right)^{-1/2}\exp\left[-i\left(f_j(k_s)-k_{0y}y\right)\right]\times\right.$$

$$\left.\times\exp\left[-\frac{(y+k_s'R^2)^2}{2R^2}\right]H_l\left(\frac{y+k_s'R^2}{R}\right)dy\right\}, \quad (16)$$

$$\Gamma(k_s) = \int u_{\mathbf{k}}^{(1)}(\mathbf{r})\,\mathbf{p}\,u_{\mathbf{k}_s}^{(2)}(\mathbf{r})\,d\mathbf{r}. \quad (17)$$

is used for the matrix element; $\vec{F}$ denotes the amplitude of the electric vector of the light wave of frequency ω; the selection rules read: $k_x = k_{ox} + k'_x$; $k_z = k_{oz} + k'_z$. The absorption coefficient is determined by the absorption probability

$$P(\omega) = (\pi\hbar^2 R^2)^{-1}\frac{e^2}{m^2\omega^2}\left|(\mathbf{F}\Gamma(k_{0x}))\right|^2\sum_{nl} S_{nl}, \quad (32)$$

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where

$$S_{nl} = \frac{D_{n}\mu Q\left[Rk_{0z} - R\varphi_1'(k_{0y})\right]}{\left\{-|\mathcal{E}_1(n_0, 0)| + \frac{\partial \mathcal{E}_1}{\partial n_0}(n - n_0) + \hbar\omega - \left(l + \frac{1}{2}\right)\hbar\Omega_2\right\}^{1/2}},$$

$$\mu = 2^{-1/2}\left\{m_{\perp}^{-1} - \hbar^{-2}\frac{\partial^2 \mathcal{E}_1(n_0, 0)}{\partial k_z^2}\right\}^{-1/2},$$

$$\mathcal{E}_1(n, 0) = -|\mathcal{E}_1(n_0, 0)| + \frac{\partial \mathcal{E}_1}{\partial n_0}(n - n_0);\quad n_0 \gg 1,$$

$$(n - n_0) \ll n_0. \tag{40}$$

The results are applied to the case of tellurium. The hole band is considered to consist of two ellipsoids of revolution situated on the C_3 axis in $\pm k_{oz}(k_{ox} = k_{oy} = 0)$. Here

$$P(\omega) = (\pi\hbar R^2)^{-1}\sum_{n, l}|W|^2\int_{-\infty}^{+\infty}\exp\left(\frac{\varepsilon_2 - \zeta}{k_0T}\right)\delta(\mathcal{E}_1 + \hbar\omega - \mathcal{E}_2)\,dk_z, \tag{41}$$

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is obtained, where ζ denotes the chemical potential, and

$$S'_{nl}=N(2\pi)^{3/2}(m_{\perp}k_0T)^{-1/2}R^2\hbar\,\mathrm{sh}\,\frac{\hbar\Omega_2}{2k_0T}S_{nl}\times$$

$$\times\exp\left\{\frac{1}{k_0T}\left[-\left(l+\frac{1}{2}\right)\hbar\Omega_2-\frac{\mu^2}{2m_{\perp}}\left(|\mathcal{E}_1(n_0,\,0)|-\hbar\omega-\right.\right.\right. \tag{42}$$

$$\left.\left.\left.-\frac{\partial\mathcal{E}_1}{\partial n_0}(n-n_0)-\left(l+\frac{1}{2}\right)\hbar\Omega_2\right)\right]\right\},$$

$$\mu=2^{-1/2}\left[m_{\perp}^{-1}+\hbar^{-2}\frac{\partial^2\mathcal{E}_1(n_0,\,0)}{\partial k_z^2}\right]^{-1/2},$$

where N is the hole concentration. The absorption spectrum considered here, which is in connection with direct band-to-band transitions of electrons, differs from the one considered in Ref. 3 (E. Burstein et al. Phys. Rev. 113, 15, 1959) by the great number of peaks; the peak height is, however, when compared with the peaks in the simplest model (Ref. 3), lower by the n-fold (n being the discrete quantum number of the magnetic oscil-

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lator in the lower band). For Te, the ratio between absorption coefficient in the magnetic field (in the maximum of oscillation) and the maximum absorption coefficient without magnetic field is equal to

$$\hbar\Omega_2 / \left(\frac{nk_0T\hbar}{\tau}\right)^{1/2} \simeq 0.1; (\hbar\Omega_2 \simeq 10^{-3}\text{ev}; k_0T \simeq 10^{-3}\text{ev}; n \simeq 100; \tau \simeq 10^{-12}\text{sec})$$

Professor A. I. Ansel'm is thanked for discussions. G. Ye. Zil'berman is mentioned. There are 1 figure and 18 references: 9 Soviet and 9 non-Soviet. The most important references to English-language publications read as follows: E. Burstein et.al. Phys. Rev. 113, 15, 1959; S. Zwerdling et al. Phys. Rev. 114, 80, 1959; L. Roth et al. Phys. Rev. 114, 90, 1959.

ASSOCIATION: Institut poluprovodnikov, AN SSSR Leningrad (Institute of Semiconductors of the AS USSR, Leningrad)

SUBMITTED: December 23, 1960

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44139
S/181/62/004/010/026/063
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24 3600

AUTHORS: Korovin, L. I., and Kharitonov, Ye. V.

TITLE: The Faraday effect in a strong magnetic field in crystals in the range of the self-absorption edge

PERIODICAL: Fizika tverdogo tela, v. 4, no. 10, 1962, 2813-2817

TEXT: The frequency dependence and the order of magnitude of oscillation of the Faraday angle, of the refractive index, and of related quantities (ellipticity of the light wave etc.) are calculated for cubic crystals in a strong magnetic field in single-electron approximation. A square law of dispersion is assumed. Moreover, the valency and conduction bands are assumed not to be degenerate and to have extrema in the center of the Brillouin zone. By use of the correspondence principle of quantum mechanics,

$$N_{\pm}=\left(n_0^2+D\sum_{s=0}^{\infty}F_s^{\pm}\right)^{1/2},$$

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is obtained for the refractive index, whereby the electrons are assumed to be classical oscillators. The Faraday angle ϑ_F, the ellipticity ε_k of the oscillations in the reflected light, the ellipticity ε_F of the transmitted light, and the rotation δ_k of the plane of polarization of the reflected light are obtained as

$$\vartheta_F = \frac{\omega z}{4n_0 c} D \sum_{n=0}^{\infty} (F_n^+ - F_n^-), \quad (13),$$

$$\varepsilon_K = -[2n_0(n_0^2 - 1)]^{-1} D \sum_{n=0}^{\infty} (F_n^+ - F_n^-). \quad (14),$$

$$(15),$$

$$\varepsilon_F = \mathrm{th}\left\{\frac{\omega z}{4n_0 c} D \sum_{n=0}^{\infty} (\Phi_n^+ - \Phi_n^-)\right\}, \quad (16),$$

$$\vartheta_K = [2n_0(n_0^2 - 1)]^{-1} D \sum_{n=0}^{\infty} (\Phi_n^+ - \Phi_n^-)$$

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where

$$F_n^{\pm}=\frac{\omega_g^{1/2}}{\omega^2}\left\{\frac{\left[\sqrt{(\omega_n^{\pm}-\omega)^2+\gamma^2}+(\omega_n^{\pm}-\omega)\right]^{1/2}}{\sqrt{2}\left[(\omega_n^{\pm}-\omega)^2+\gamma^2\right]^{1/2}}+\frac{1}{(\omega_n^{\pm}+\omega)^{1/2}}-\frac{2}{(\omega_n^{\pm})^{1/2}}\right\}, \quad (8),$$

$$\Phi_n^{\pm}=\frac{\omega_g^{1/2}}{\sqrt{2}\,\omega^2}\left\{\frac{\left[\sqrt{(\omega_n^{\pm}-\omega)^2+\gamma^2}-(\omega_n^{\pm}-\omega)\right]^{1/2}}{\left[(\omega_n^{\pm}-\omega)^2+\gamma^2\right]^{1/2}}\right\}, \quad (9),$$

$$\omega_g=\frac{E_g}{\hbar};\quad \omega_n^{\pm}=\omega_g+\Omega\left(n+\frac{1}{2}\right)\pm\delta, \quad (10),$$

$$D=\frac{\hbar\Omega}{E_g}\frac{|C|^2}{mE_g}\left(\frac{2\mu}{m}\right)^{1/2}\frac{e^2m^{1/2}}{\hbar E_g^{1/2}}. \quad (11).$$

Here E_g is the forbidden band width, Ω is the Larmor frequency. δ_F and ε_k are determined by the oscillating functions $F_m^{\pm} = \sum F_n^{\pm}$. $F_m^{\pm}$ have maxima at $\omega = \omega_g + \Omega(1 + 1/2) \pm \delta$; the maxima of F_m^{-} are shifted with respect to the maxima of F_m^{+} by 2δ. Under the condition of a good resolution of the oscillations, $\Delta\vartheta_F = \vartheta_{F\,max} - \vartheta_{F\,min} \simeq 10^3 z$ radian/cm, where z is the sample thickness. It is shown that the oscillations of the Faraday angle and of

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The Faraday effect in a strong...

the ellipticities can be resolved better than the oscillations of the refractive index, since these are very low as compared with the constant background. The English-language references are: E. Burstein et al., Phys. Rev., 113, 15, 1959; R. Stevenson. Can. Journ. Phys., 38, 941, 1961; B. Lax, J. Nishina. Journ. Appl. Phys., 32, 2128, 1961.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors AS USSR, Leningrad)

SUBMITTED: May 26, 1962

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APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

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KOROVIN, L.I.; KHARITONOV, Ye.V.

Faraday effect in a high magnetic field in crystals near the fundamental absorption edge. Fiz.tver.tela 4 no.10:2813-2817 O '62. (MIRA 15:12)

1. Institut poluprovodnikov AN SSSR, Leningrad.
(Faraday effect) (Magnetic fields) (Crystallography)

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L 19738-63 EWT(1)/BDS AFFTC/ASD/IJP(C) S/0181/63/005/007/2035/2038

ACCESSION NR: AP3003917

AUTHORS: Korovin, L. I.; Kharitonov, Ye. V.

TITLE: Interzonal Faraday effect in Ge in a strong magnetic field

SOURCE: Fizika tverdogo tela, v. 5, no. 7, 1963, 2035-2038

TOPIC TAGS: Faraday effect, interzonal effect, Ge, magnetic field, quantized field, quantum number, semiconductor, valence band, degeneracy, dielectric constant, conduction band, electron, relaxation time

ABSTRACT: The authors have extended the results of their previous work (FTT, 4, 2813, 1962) to the case of direct transitions in semiconductors such as Ge and have compared this theory with the experimental work of Y. Nishina, I. Kolodziejczak, and B. Lax (Phys. Rev. Lett., 9, 55, 1962). The results are shown in Fig. 1 (see enclosures). The relative contribution of "light" and "heavy" holes in the Faraday effect in Ge is determined chiefly by the coefficients of $c^{\pm}_{\rho}(\lambda)$, where c is the velocity of light, ρ the level into which the valence bands have split, and λ the Landau number. Thus, when the angle of Faraday rotation is greater than zero, "light" holes (2^+) play the principal role, but when it is less than zero "heavy" holes (1^-) are dominant. It is noted that for "light" holes the quasiclassical

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ACCESSION NR: AP3003917

value of effective mass and of energy levels is reached when $\ell = 5-6$. A characteristic feature of the valence zone in Ge in a quantized magnetic field is the presence of holes with negative effective mass. It may be pointed out that their influence on the Faraday effect in the basic part of the Faraday rotation (as a function of frequency) for corresponding transitions is determined by direct transitions from regions where the effective mass is positive. The contribution is small in the region where the effective mass is negative. Orig. art. has: 1 figure and 4 formulas.

ASSOCIATION: Institut poluprovodnikov AN SSSR, Leningrad (Institute of Semiconductors, Academy of Sciences, SSSR)

SUBMITTED: 19Mar63 DATE ACQ: 15Aug63 ENCL: 02

SUB CODE: PH NO REF SOV: 001 OTHER: 007

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L 3337-66 EWT(1)/T IJP(c)
ACCESSION NR: AP5017314 UR/0181/65/007/007/2162/2173

AUTHORS: Korovin, L. I.; Kharitonov, Ye. V. 44,55

TITLE: Theory of the line shape of interband magnetooptical absorption in the case of elastic scattering

SOURCE: Fizika tverdogo tela, v. 7, no. 7, 1965, 2162-2173

TOPIC TAGS: magnetooptic effect, semiconductor band structure, elastic scattering, electron scattering, absorption line

ABSTRACT: The purpose of the investigation was to ascertain the shape of the peaks of the interband magnetooptical absorption when successive account is taken of the interaction between the electrons and the scatterers, and to establish how the constants that determine the absorption curve depend on the magnetic field and on the temperature. This is done by developing the quantum theory of the line shape in semiconductors with a simple band structure. The nonstationarity of the electronic state is assumed to be due to elastic scattering of the electrons by the acoustic phonons. A rigorous theory is developed

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ACCESSION NR: AP5017314

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for the quasiclassical case, when the transitions of the electron under the influence of the light occur between Landau bands with large quantum numbers. The absorption peaks are determined by a function of the reciprocal relaxation time, which depends on the frequency of the light and on the electron momentum. It is shown that in the case of transitions between the first Landau bands there is no small parameter in which to expand the expression for the resonant absorption line shape. 'We are grateful to A. I. Ansel'm, 44,55 Ye. K. Kudinov, 44,55 and Yu. A. Firsov for useful discussions.' Orig. art. has: 3 figures and 32 formulas 44,55

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors AN SSSR) 44,55

SUBMITTED: 13Feb65 ENCL: 00 SUB CODE: OP, NP

NR REF SOV: 003 OTHER: 001

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

L 9241-66 EWT(l)/EWT(m)/EWP(t)/EWP(b) IJP(c) JD/WW/GG

ACC NR: AP5022749 SOURCE CODE: UR/0181/65/007/009/2873/2875

44,55

AUTHOR: Korovin, L. I.

44,55

ORG: Institute of Semiconductors AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

58
56
B

TITLE: Magnetophonon resonance in the neighborhood of the natural absorption edge

SOURCE: Fizika tverdogo tela, v. 7, no. 9, 1965, 2873-2875

21,44,55

TOPIC TAGS: crystal theory, phonon scattering, phonon spectrum, magnetooptics, absorption edge, light absorption, electron transition

21,44,55

ABSTRACT: The author evaluates the amplitude of the secondary oscillations in the interband coefficient of light absorption due to singularities in scattering of electrons by optical (polarized) phonons in a crystal in a strong magnetic field. The form of the absorption peaks close to the maximum is determined by the unsteadiness of the electron states taking part in the interband transition. This unsteadiness is dependent on scattering of electrons and holes. The author considers the n-th absorption peak, which corresponds to direct transition between n Landau levels of the valence band and the conduction band. A model is proposed for the electron transitions and formulas are derived for the coefficient of absorption at maximum magneto-optical oscillation, and for maximum and minimum relaxation times for scattering by

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ACC NR: AP5022749

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optical phonons. It is found that the amplitude of the secondary oscillations for parameters close to those of indium antimonide is 20% of the maximum for the absorption coefficient. Other parameters which determine the form of the absorption peak, e. g. its halfwidth, will oscillate in a similar manner. The difference in this case is that the minima for the halfwidth will correspond to the magnetophonon maxima in peak height, and vice versa. Orig. art. has: 1 figure, 2 formulas.

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

L 21138-66 EWT(1)/ IJP(c)
ACC NR: AP6003784 SOURCE CODE: UR/0181/66/008/001/0181/0186

AUTHORS: Korovin, L. I.; Kharitonov, Ye. V.

ORG: Institute of Semiconductors AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: Contribution to the theory of interband magnetooptic absorption in the case of scattering by impurities

SOURCE: Fizika tverdogo tela, v. 8, no. 1, 1966, 181-186

TOPIC TAGS: magnetooptic effect, impurity scattering, light absorption, phonon, elastic scattering, electron scattering

ABSTRACT: This is a continuation of an earlier study (FTT v. 7, 2162, 1965) of the line shape of magnetooptic absorption in the case when the nonstationary behavior of the electronic states is determined by the elastic scattering by acoustic phonons. The present study deals with the case when the nonstationary behavior is governed by scattering of the electrons by neutral impurities with short-life potential of randomly (uniformly) distributed impurity atoms in a

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ACC NR: AP6003784

strong magnetic field. The calculation procedure is based on a method developed by O. V. Konstantinov and V. I. Perel' (ZhETF v. 39, 197, 1960). Both attracting and repelling potentials are considered. It is shown that in order to describe the scattering by the impurities in magnetooptic effects in semiconductors it is necessary to introduce two parameters, one of which depends only on the interaction between the carrier and the impurity atom, and the other depends also on the impurity concentration. The case when the impurity concentration increases linearly is considered. The formulas obtained for the absorption coefficient are found to be valid for concentrations lower than 10^{15} -- 10^{16} cm^{-3}. Orig. art. has: 3 figures and 15 formulas.

SUB CODE: 20/ SUBM DATE: 12Jul65/ ORIG REF: 004/

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L 36256-66 IJP(c)

ACC NR: AP6019277 SOURCE CODE: GE/0030/66/015/002/0751/0759 62
UR B

AUTHOR: Korovin, L. I.

ORG: Institute of Semiconductors, Academy of Sciences of the USSR, Leningrad

SOURCE: Physica status solidi, v. 15, no. 2, 1966, 751-759

TITLE: Magnetophonon oscillations of the light absorption coefficient in the intrinsic absorption region

TOPIC TAGS: magneto~~phonon~~ oscillation, light absorption, electron, optical phonon, magnetic field, ~~magneto~~phonon, magnetooptic~~al~~ effect, absorption band

ABSTRACT: A theory is developed for the linear shape of the interband, oscillatory, magneto-optical, absorption coefficient. The nonstationary character of the electron is assumed to originate from inelastic interactions between electrons and optical (polar) phonons. It is

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ACC NR: AP6019277

shown that the width and shift of electron levels depends non-monotonically on the magnitude of the magnetic field, which leads to additional magnetophonon resonance-type oscillations of the absorption coeffieicnt. Theoretical estimates indicate that these additional oscillations should be experimentally observable. Orig. art. has: 1 figure and 31 formulas. [Author's abstract.] [KS]

SUB CODE: 20/ SUBM DATE: 25Feb66/ ORIG REF: 005/ OTH REF: 001

Card 2/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

L 46941-66 EWT(1)/T IJP(c) WW/GG

ACC NR: AP6015510 SOURCE CODE: UR/0181/66/008/005/1652/1654

58
B

AUTHOR: Korovin, L. I.

ORG: Institute of Semiconductors, AN SSSR, Leningrad (Institut poluprovodnikov AN SSSR)

TITLE: The effect of the inelasticity of scattering upon the shape of the oscillations of interzone magnetooptic phenomena

SOURCE: Fizika tverdogo tela, v. 8, no. 5, 1966, 1652-1654

TOPIC TAGS: inelastic scattering, perturbation theory, magnetooptic effect, semiconductor research, phonon interaction

ABSTRACT: An approach to the theory of the shape of the oscillations of the interzone coefficient of light absorption in an intense magnetic field is suggested for the case where the unsteady electron states are caused by acoustic phonons. The function *W*, which defines the unsteady states, could not be computed in linear approximation because all graphs describing a series of the theory of perturbations for *W* were on resonant frequencies; i. e., the problem lacked a small parameter. In this study, the function *W* is calculated. A consideration of the inelastic scattering of electrons on acoustic phonons introduces in the denominators the resonant sections of several new addends, i. e., the frequency of the acoustic phonon, the speed of sound, and the absolute value of the wave vector of the phonon. This makes the graphs finite at reso-

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ACC NR: AP6015510

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nance points. A calculation and subsequent analysis show that there might be two possibilities: (1) The relations between the constants are such that all terms of the theory of perturbation series for W are magnitudes of the same order. In this case, inelastic scattering is not essential, and there is no substantial difference between that problem and elastic scattering; (2) The other alternative occurs when

$$\left|\frac{W_2}{W_1}\right| \ll 1,$$

where W_2 is the sum of four graphs of second order not counting the intersections of the phonon lines at resonance; W_1 is the sum of the two graphs with one phonon line at resonance point. However, alternative (1) is more likely to ccur in modern semiconductors. Orig. art. has: 6 formulas.

SUB CODE: 20/ SUBM DATE: 04Jan66/ ORIG REF: 003

Card 2/2

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

NIKITIN, Petr Arkad'yevich; KOROVIN, M.A., red.; SAYTANIDI, L.D., tekhn. red.

[Argudan millions] Argudanskie milliony. Moskva, Izd-vo M-va sel'. khoz. RSFSR, 1960. 84 p. (MIRA 14:7)
(Argudan—Corn (Maize))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

SHATS, Ye.L.; BODIN, A.P.; KOROVIN, M.A., red.; SAYTANIDI, L.D., tekhn. red.

[Safety engineering in rural electric power systems; electrician's manual] Tekhnika bezopasnosti v sel'skikh elektroustanovkakh; pamiatka elektromontera. Moskva, Izd-vo M-va sel'.khoz. RSFSR, 1961. 39 p. (MIRA 14:11)

(Rural electrification—Safety measures)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

FOMIN, A.P.; OVCHINNIKOV, F.M.; KOROVIN, M.A.; MAKURIN, N.D.; KOMAROVA, T.A.; SMIRNOVA, V.A.; ZELENETSKAYA, L.V., red.; SAYTANIDI, L.D., tekhn. red.

[Wages on state farms and other state agricultural enterprises; basic regulations and instructions on wages]Oplata truda v sovkhozakh i drugikh gosudarstvennykh predpriiatiiakh; sbornik osnovnykh polozhenii i ukazanii po oplate truda. Moskva, Izd-vo MSKh RSFSR, 1962. 483 p. (MIRA 16:2)

1. Russia (1917- R.S.F.S.R.)Upravleniye organizatsii truda i zarabotnoy platy. 2. Upravleniye organizatsii truda i zarabotnoy platy Ministerstva proizvodstva i zagotovk sel'skokhozyaystvennykh produktov RSFSR (for all except Zelenetskaya, Saytanidi).

(Agricultural wages)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, M.F.

Diminish the distances between underground networks. Stroi. truboprov. 9 no.10:29-31 O '64. (MIRA 18:7)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

BUNCHUK, Vitaliy Aleksandrovich; LUR'YE, Pavel Abramovich; KOROVIN, Mikhail Stepanovich; SOLGANIK, G.Ya., vedushchiy red.; GANINA, L.V., tekhn.red.

[Reflection type of insulation for oil-storage tanks; protection of tanks against solar radiation] Otrazhatel'no-teplovaia izoliatsiia rezervuarov dlia nefteproduktov; zashchita rezervuarov ot solnechnoi radiatsii. Moskva, Gos.nauchno-tekhn.izd-vo neft. i gorno-toplivnoi lit-ry, 1959. 80 p. (MIRA 12:10)
(Tanks) (Solar radiation)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, M.S., inzh.

Using industrial methods in assembling heat-insulating elements.
Nov.tekh.mont. i spets.rav. v stroi. 21 no.10:10-13 O '59.
(MIRA 12:11)

1. Institut Teploproyekt.
(Insulation (Heat))

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.

Preventing fires during motion-picture projection. Pozh.delo 5 no.9:15 S '59. (MIRA 13:1)

1. Starshiy inzhener Glavnogo upravleniya kinofikatsii i kinoprokata Ministerstva kul'tury Tadzhikskoy SSR.
(Tajikistan--Motion-picture projection--Safety measures)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

1. KOROVIN, N. A.; GOLUBEV, P. A., Eng.

2. USSR (600)

4. Loading and Unloading

7. Use of winch TL-3 for loading firewood, Les. prom., 13, No. 4, 1953.

9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

~~KOROVIN, N.A.,~~

Labor productivity and new equipment in weaving. Tekst.prom. 23 no.1:22-25 Ja '63. (MIRA 16:2)

1. Starshiy inzhener-konstruktor Vsesoyuznogo nauchno-issledovatel'skogo instituta legkogo i tekstil'nogo mashinostroyeniya (VNIILTekmash).
(Machinery in industry)
(Textile industry)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N. G.

USSR/Chemical Technology. Chemical Products and Their Application -- Wood chemistry products. Cellulose and its manufacture. Paper, I-23

Abst Journal: Referat Zhur - Khimiya, No 2, 1957, 6251

Author: Bazanov, B. M., Korovin, N. G.

Institution: ~~None~~ Bobruyskiy gidroliznyy zavod

Title: Improvement in Mixer for Cooking Acid

Original Publication: Gidroliznaya i lesokhim. prom-st', 1956, No 5, 22

Abstract: The conventional mixer is fitted with rings 30-100 mm long made of fluoroplastic and provided with eccentrically disposed apertures. The first experiment of its use was successful.

Card 1/1

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

BERNSHTEYN, [illegible], inzh.; VALYUZHINICH, V.Ia., inzh.; GDALIN, A.D., inzh.; GOLOVKO, V.A., inzh.; GOLULEVA, N.V., inzh.; GUREVICH, V.G., inzh.; KOROVIN, N.I., inzh.; KURDOV, V.G., inzh.; [illegible], I.M., inzh.; MITRYASHIN, M.L., inzh.; OGANESOV, N.G., inzh.; OKUNEV, N.A., inzh.; TURZHITSKIY, V.I., inzh.; YUFIT, B.P., inzh.; SHEL'VAKH, V.F., inzh.

[Manual on the quarrying and processing of rock building materials] Spravochnik po dobyche i pererabotke nerudnykh stroitel'nykh materialov. Leningrad, Stroiizdat, 1965. 520 p. (MIRA 18:2)

1. Vsesoyuznyy gosudarstvennyy institut po proyektnym i nauchno-issledovatel'skim rabotam promyshlennosti nerudnykh stroitel'nykh materialov.

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOTSAGA, I.N. (Kuybyshev); AFONICHKIN, N.I., dorozhnyy dispatcher (Kuybyshev); KOROVIN, N.I., dorozhnyy dispatcher (Kuybyshev)

Efficient routing of car flows. Zhel. dor. transp. 47 no.3: 14-16 Mr '65. (MIRA 18:5)

1. Nachal'nik sluzhby dvizheniya Kuybyshevskoy dorogi (for Kotsaga).

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.K.

(From material submitted to the editorial office--M.G.Lagereva).
KOROVIN, N.K. (Post graduate student, City of Omsk, Veterinary Institute) "Experimental data on the Concentration of Penicillin in the Blood of Calves in Various Methods of Injection and Dosage."
SO: Veterinariya; Vol.31, No.6; 44-48; June 1954; uncl

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N. K.

"Penicillin-Sulfathiazol Therapy of Pneumonia in Calves and Experimental Data on the Concentration of Penicillin and Some Sulfanilamide Preparations in the Blood." Cand Vet Sci, Omsk State Veterinary Inst, Omsk, 1954. (RZh BiolKhim, No 2, Jan 55)

Survey of Scientific and Technical Dissertations Defended at USSR Higher Educational Institutions (12)
SO: Sum. No. 556, 24 Jun 55

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.K., aspirant.

Use of penicillin and sulfathiazole for treating pneumonia in calves. Veterinariia 32 no.1:57-60 Ja '55. (MLRA 8:2)

1.Omskiy veterinarnyy institut.
(PENICILLIN) (SULFATHIAZOLE) (CALVES--DISEASES)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N. K. (Candidate of Veterinary Sciences, Omsk Veterinary Institute.)

"Treatment of necrobacillosis of the extremeties in cattle."

Veterinariya, Vol. 38, No. 5, 1961

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N. N.

KOROVIN, N. N.: "The junction points of the assembled reinforced-concrete skeletons of multistory industrial buildings" (Problems of calculation, design, and assembly). Moscow, 1955. Min Higher Education USSR. Moscow Order of Labor Red Banner Construction Engineering Inst imeni V.V. Kuybyshev. (Dissertation for the Degree of Candidate of TECHNICAL Sciences)

SO: Knizhnaya Letopis' No. 51, 10 December 1955

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.N., inzhener; KRYLOV, S.M., kandidat tekhnicheskikh nauk

An investigation of the joints of precast reinforced concrete elements of building frames. Stroi.prom.33 no.6:33-36 Je'55. (Precast concrete construction) (MLRA 8:10)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.N., kand.tekhn.nauk

Fastening rails to the reinforced concrete beams under cranes.
(Reinforced concrete) (Cranes, derricks, etc.)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROLEV, L.V., inzh.; KOROVIN, N.N., kand. tekhn. nauk

Study of the function of a socketlike joint of a column with a foundation. Bet. i zhel.-bet. 9 no.10:459-462 O '63. (MIRA 16:12)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROLEV, L.V., inzh.; KOROVIN, N.N., kand. tekhn. nauk

Problems in the calculation and manufacture of sockets for precast reinforced concrete columns with footings. Prom. stroi. 41 no.6: 44-48 Ke '64. (MIRA 17:9)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V.

137-58-5-10363 D

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 5, p 210 (USSR)

AUTHOR: Korovin, ~~N. V.~~

TITLE: The Process Occurring at the Cathode in the Electrical Deposition of Iron-nickel Alloy, and the Properties of the Resultant Platings (Katodnyy protsess pri elektroosazhdenii splava zhelezo-nikel' i svoystva pokrytiy)

ABSTRACT: Bibliographic entry on the author's dissertation for the degree of Candidate of Technical Sciences, presented to the Mosk. in-t tsvetn. met. i zolota (Moscow Institute of Nonferrous Metals and Gold), Moscow, 1957

ASSOCIATION: Mosk. in-t tsvetn. met. i zolota (Moscow Institute of Nonferrous Metals and Gold), Moscow

1. Electroplating--Analysis 2. Finishes--Properties 4. Cathodes (Electrolytic cell)--Properties

Card 1/1

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V.

The cathodic process in the electrodeposition of iron-nickel alloys. Zhur.neorg.khim. 2 no.9:2259-2263 S '57. (MIRA 10:12)
(Electroplating) (Iron-nickel alloys)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

SOV/137-58-8-17465

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 8, p 180 (USSR)

AUTHORS: Korovin, N.V., Titov, P.S.

TITLE: Electrolytic Deposition of an Iron-nickel Alloy (Elektroosazhdeniye splava zhelezo-nikel')

PERIODICAL: Sb. nauchn. tr. Mosk. in-t tsvetn. met. i zolota, 1957, Nr 27, pp 300-313

ABSTRACT: The process of electrolytic deposition of Fe-Ni alloys from chlorous solutions in the presence of Na citrate and H_3BO_3 was investigated. Relationships were established betweeen the composition of an Fe-Ni alloy and its current efficiency and as against the current density, concentration of Na citrate, total concentration of metals, pH of the solution, and stirring. The study of the cathode potentials during the deposition of the alloy and, taking into account the current efficiency, of the portion of the current expended on the deposition of the metal (or alloy), showed that in the separate deposition the curve for the Ni discharge is always more positive by 100-150 mv than the curve of the Fe discharge; however, in the case of the combined discharge, the curve of the relationship of the rate of the reaction

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SOV/137-58-8-17465

Electrolytic Deposition of an Iron-nickel Alloy

to the cathode potential for Ni, by contrast, lies in a more negative region than the curve for Fe. The curve of the relationship of the rate of the reaction of deposition of the alloy to the potential lies between the Fe and Ni curves. In the combined deposition the rate of the discharge of Fe ions increases and that of Ni ions decreases, which phenomenon is explained by the depolarizing effect of Ni during the formation of the solid solution and by the fact that the reaction of reduction of Fe, proceeding with a lower overvoltage, depresses the reaction of the reduction of Ni, which proceeds with a greater overvoltage. The analysis of processes of electrolytic deposition of a series of other alloys in which ions with a great difference in overvoltage are discharged confirms the opinion expressed on the predominance of that process having the lower energy of activation. Therefore, all the factors contributing to a decrease of the overvoltage of the deposition of the alloy should increase the rate of discharge of Ni which actually takes place up to a certain current density (1 amp/dm^2) when the action of the concentrational factors begins to appear. On the basis of the study of the cathode process the opinion is expressed that the complex ion of Ni and citrate is more stable than the analagous ion of Fe.

1. Iron-nickel alloys--Electrodeposition N.O.

Card 2/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

SOV/137-58-10-21367

Translation from: Referativnyy zhurnal, Metallurgiya, 1958, Nr 10, p 131 (USSR)

AUTHORS: Korovin, N. V., Titov, P. S.

TITLE: Properties of Iron-nickel Alloy Coatings (Svoystva pokrytiy iz splava zhelezo-nikel')

PERIODICAL: Izv. vyssh. uchebn. zavedeniy. Tsvetn. metallurgiya, 1958, Nr 1, pp 164-170

ABSTRACT: The results of a study of the structure and properties (microhardness, internal stresses, and magnetic characteristics) of electrolytic Fe-Ni coatings deposited from sulfate and chloride electrolytes of various compositions onto polished Cu sections (Minimum thickness of the coatings is 15 μ). The phase composition was determined by X-ray diffraction. The hardness of the Fe-Ni coatings proved to be greater than the hardness of Fe and Ni deposits (especially from sulfate solutions) and approaches the hardness of electrolytically deposited Cr; it varies with the temperature of the electrolyte and the cd. Electrolytically deposited Fe-Ni alloy exhibits high internal stresses owing to the distortion of the lattice parameters, possesses a very fine crystalline structure and luster, and constitutes a solid Fe-Ni

Card 1/2

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Properties of Iron-nickel Alloy Coatings

solution. Electrolytically deposited alloys exhibit a higher coercive force and a lower residual induction than rolled and heat-treated alloys. The great hardness, the beautiful appearance, and a sufficiently high corrosion resistance of coatings containing up to 30% Fe provide a basis for the assumption that they might replace nickel and sometimes even chromium coatings. Bibliography: 14 references.

1. Iron nickel alloy coatings--Properties

B. L.

Card 2/2

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KUZ'KIN, S.F.; KOROVIN, N.V.

Research carried out in 1958 by the M.I.Kalinin Institute of Nonferrous Metals and Gold in Moscow. Izv.vys.ucheb.zav.; tsvet.met. 2 no.4:151-152 '59. (MIRA 13:1)
(Moscow--Metallurgical research)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V.

Cathodic process in the electrodeposition of copper-nickel alloys.
Izv. vys. ucheb. zav.; tsvet. met. 2 no.3:123-129 '59.
(MIRA 12:9)

1. Moskovskiy institut tsvetnykh metallov i zolota, Kafedra elektrokhimii i korrozii.
(Copper-nickel alloys--Electrometallurgy)

Corrosion

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V.

Electrode potentials of metals. Izv. vys. ucheb. zav; khim. i khim. tekh. 3 no. 5:844-847 '60. (MIRA 13:12)

1. Krasnoyarskiy institut tsvetnykh metallov. Kafedra elektrokhimii i korrozii.
(Metals--Electric properties)
(Electromotive force)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V.

Metal classification. Izv.vys.ucheb.zav.; tsvet.met. 3 no.2:50-53 '60. (MIRA 15:4)

1. Krasnoyarskiy institut tsvetnykh metallov.
(Metals--Classification)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

11800 2808, 2208, 1087, 1273

25658
S/080/60/033/012/014/024
D209/D305

AUTHORS: Korovin, N.V., and Ronzhin, M.N.

TITLE: Deposition of alloy Rhenium nickel on a cathode from an ammonium perrhenate electrolyte

PERIODICAL: Zhurnal prikladnoy khimii, v. 33, no. 12, 1960, 2734 - 2738

TEXT: Rhenium deposits have valuable properties - resistance to wear, corrosion and heat, but the current efficiency of rhenium deposited from aqueous solutions is very low. It was found that current efficiency of rhenium, simultaneously deposited with nickel to from an alloy, is high and the alloy deposited has the same resistance to wear, corrosion and heat as the pure rhenium deposit and an even higher resistance to atmospheric conditions. Four polarization curves i.e. current density-cathode potential curves constructed during the deposition of rhenium and rhenium nickel alloy from electrolyte are represented in Fig. 1 for pH values of pH = 1,

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

25658
S/080/60/033/012/014/024
D209/D305

Deposition of alloy Rhenium ...

pH = 2, pH = 2.5 and pH = 3. Curve 1 has no bend - pure rhenium was deposited. Curve 2 for pH2, curve 3 for pH 2.5 and curve 4 for pH 3 have a bend. In these pure rhenium was deposited at current densities below the bends; above these current densities the alloy was deposited. As shown on curve 2 (Fig. 1) the alloy at pH 2 starts depositing at a current density of 4 amp/dm^2. Curves in Fig. 2 represent (for an electrolyte with pH = 2 operated at current density of 4 amp/dm^2) the dependence of current efficiency (in %) on the current density (in amp/dm^2) for nickel in alloy - curve 1, for rhenium in alloy - curve 2 and for rhenium nickel alloy - curve 3, as well as the dependence of content of nickel in alloy (in %) on current density - curve 1' and the content of rhenium in alloy (in %) in current density - curve 2'. Fig. 2 shows that current efficiency of rhenium is 18 % and that current efficiency of rhenium when it starts depositing with nickel increases to 78 %. The operating conditions have little effect on the content of rhenium in the alloy; pH change from 2 to 8 leads to the increase of Re content by 3.4 %. The increase of current density from 2 to 14 amp/dm^2 has

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Card 2/6

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

25658
S/080/60/033/012/014/024
D209/D305

Deposition of alloy Rhenium ...

practically no effect as shown in Fig. 2. The increase of temperature from 30° to 78°C causes an increase of the rhenium content by 2.8 %. By plotting Ni/(Ni + Re) of the deposited alloy against Ni/(Ni + Re) of the solution a straight line with slope of about 0.5 is obtained which indicates that the content of nickel in the deposited alloy increases with an increase of nickel in the solution. Current efficiency increases slightly with increase of temperature. Since the current efficiency decreases with an increase of current density (as shown in Fig. 2) and with an increase of pH the solution should have a good throwing power as the current density and pH value are usually lower in the recesses. Optimum operating conditions for deposition of the high grade rhenium nickel deposit were found to be: Temperature of 70°C, pH 2-3 and current density of 2 - 4 amp/dm^2. The increase of current efficiency of rhenium simultaneously deposited with nickel can be explained by the depolarization of metal deposition since it was found that the rhenium nickel alloy may be deposited at a potential less cathodic than that necessary for the deposition of nickel and rhenium in the pure state. Depolarization of metal deposition sometimes occurs X

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25658
S/080/60/033/012/014/024
D209/D305

Deposition of alloy Rhenium ...

when two metals which separate simultaneously form a solid solution, as is the case with rhenium nickel alloy which is a solid solution of rhenium in nickel. However, depolarization of the rhenium deposition cannot be explained only by the formation of solid solution, as it should be small compared with that of nickel, but also by the increase in hydrogen overvoltage during alloy deposition. There are 5 figures and 11 references: 7 Soviet-bloc and 4 non-Soviet-bloc. The references to the English-language publications read as follows: L.E. Netherton, M.L. Holt, J. Electrochem. Soc. 98, 3, 106, 1951; K.M. Gorbunova, Yu.M. Polukarov, V.V. Bondar, Electrochem. acta. 1, 4, 358, 1959; C.B.F. Young, Metal End (N.Y.) 34, 176, 1936.

X

SUBMITTED: April 9, 1960

Card 4/6

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KOROVIN, N.V.

Overvoltage of the iron group metals. Zhur.fiz.khim. 34 no.1: 219-224 Ja '60. (MIRA 13:5)
(Iron group) (Overvoltage)

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N.V. (Moscow)

Cathodic polarization in the electrodeposition of a copper-nickel alloy. Zhur.fiz.khim. 34 no.6:1351-1356 Je '60. (MIRA 13:7)

1. Institut tsvetnykh metallov.
(Copper-nickel alloys) (Polarization(Electricity))
(Electroplating)

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18 7400

S/076/61/035/003/020/023
B121/B206

AUTHORS: Korovin, N. V. and Ronzhin, M. N.

TITLE: Electrodeposition of rhenium from ammonium-sulfate solutions

PERIODICAL: Zhurnal fizicheskoy khimii, v. 35, no. 3, 1961, 660-664

TEXT: The effect of ammonium-sulfate content, temperature, current density, and pH value on the electrodeposition of rhenium from sulfuric-acid solutions which contain ammonium sulfate was studied. Recrystallized potassium perrhenate and ammonium sulfate were used as initial materials. 15 g of $KReO_4$/l and 200 g of $(NH_4)_2SO_4$/l are recommended as the best electrolyte. At pH = 1.0, a temperature of 70°C, and a current density of 10-15 a/dm^2, the yield related to the current amounts to 25-28%, and depends on the pH value of the solution, especially at pH < 5. The polarization curves of rhenium deposition were recorded for different pH values. On the curves discharge rate versus cathode potential obtained for different pH values, a minimum and a maximum were found for pH = 2 and pH = 2.5, respectively. Some peculiarities of the cathodic process of the electrodeposition of rhenium

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B121/B206

Electrodeposition of ...

are discussed. At pH = 1 and low current densities, as well as at pH = 2 and 2.5, the electrodeposition of rhenium proceeds under the direct action of hydrogen according to the equation $ReO_4^- + 8H^+ + 7e^- \longrightarrow Re + 4H_2O$ (1). With reduced hydrogen-ion concentration, the reduction of potassium perrhenate proceeds without the action of hydrogen according to the equation $ReO_4^- + 7e^- + 4H_2O \longrightarrow Re + 8OH^-$ (3). Addition of ammonium sulfate to the electrolyte improves its buffer effect and increases the hydrogen-ion concentration in the cathode layer; the electrodeposition of rhenium is thus facilitated, and the yield related to the current is increased. It is assumed that positively-charged ammonium ions favor the incorporation of ReO_4^- anions into the cathode layer. Moreover, ammonium sulfate is able to depassivate the cathode. There are 4 figures, 1 table, and 10 references: 4 Soviet-bloc and 6 non-Soviet-bloc. The four references to English-language publications read as follows: Ch. K. Sims, C. M. Craghead, N. F. Jaffe, J. Metals, 7, 168, 1955; C. G. Fink, P. Deren, Trans. Elektrochem. Soc., 66, 471, 1934; C. B. F. Joung, Metal Industr., 34, 177, 1936; L. E. Nethertou, M. L. Holt, J. Electrochem. Soc., 95, 324, 1949.

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

Electrodeposition of ... S/076/61/035/003/020/023
B121/B206

ASSOCIATION: Institut tsvetnykh metallov im. M. I. Kalinina (Institute of Nonferrous Metals imeni M. I. Kalinin)

SUBMITTED: July 16, 1959

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"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

KOROVIN, N., kand.tekhn.nauk; CHERKASSKIY, V., inzh.; LEONOV, V., inzh.

Equipment for the reconditioning of electroplating. Avt.transp. 39 no.12:42-43 D '61. (MIRA 15:1)

(Electroplating)

APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0"

"APPROVED FOR RELEASE: 06/14/2000 CIA-RDP86-00513R000824920006-0

S/137/62/000/007/068/072
A160/A101

AUTHORS: Korovin, N. V., Velichko, Yu. A., Konstantinova, G. S.

TITLE: The electrodeposition of the lead-thallium alloy

PERIODICAL: Referativnyy zhurnal, Metallurgiya, no. 7, 1962, 98 - 99, abstract 7I668 ("Sb. nauchn. tr. In-t tsvetn. met. im. M. I. Kalinina", 1960, 33, 400 - 404)

TEXT: The deposition of Tl was carried out with hydrofluoboric and perchlorate electrolytes. It is possible to obtain good-quality Pb-Tl layers in a perchlorate solution containing Tl, Pb salts, free perchloric acid, size and peptone. The composition of the alloy depends on the Pb : Tl ratio in the electrolyte. Varying the ratio, it is possible to obtain alloys of any composition. When increasing D_c, the content of Tl in the alloy also increases. A decrease in the concentration of free perchloric acid, especially below 10 - 20 g/1, reduces the content of Tl in the deposit. The yield of the alloy by current is close to 100% and is slightly affected by electrolysis conditions. There are 7 references.

Ye. Layner

[Abstracter's note: Complete translation]

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PHASE I BOOK EXPLOITATION SOV/6040

Korovin, Nikolay Vasil'yevich

Novyye pokrytiya i elektrolity v gal'vanotekhnike (New Coatings and Electrolytes in Electroplating) Moscow, Metallurgizdat, 1962. 134 p. Errata slip inserted. 7300 copies printed.

Ed.: G. T. Bakhvalov; Ed. of Publishing House: M. S. Arkhangel'skaya; Tech. Ed.: A. I. Karasev.

PURPOSE: This book is intended for engineering personnel of plants and scientific research organizations, and for students at schools of higher education who are specializing in the field of the protection of metals against corrosion.

COVERAGE: The book reviews certain new trends in electroplating and describes new types of coatings, electrolytes, and methods of deposition of such coatings. Also reviewed are works of Soviet and non-Soviet researchers in electroplating and industrial practice in this field. The author thanks G. T. Bakhvalov, Doctor of Technical Sciences, Ye. M. Zaretskiy, Candidate of

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Technical Sciences, and Professors V. I. Layner, and P. S. Titov for their valuable comments. There are 415 references, both Soviet and non-Soviet.

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